

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Withdrawn) The use of an isolated polynucleotide in the development of a medicament for the prevention and treatment of diseases and medical conditions in which proton homeostasis is imbalanced; said polynucleotide is selected from one of the groups consisting of:
  - (a) an isolated polynucleotide comprising the polynucleotide sequence of human OGR1 (accession number: NM\_003485.1), rat OGR1 (accession number: XM\_234483), mouse OGR1 (accession number: NM\_175493), bovine OGR1 (accession number: NM\_174329), preferably human OGR1 (accession number: NM\_003485.1), human GPR4 (accession number: NM\_005282), mouse GPR4 (accession number: NM\_175668), human TDAG8 (accession number: NM\_003608) and mouse TDAG8 (accession number: NM\_008152);
  - (b) an isolated polynucleotide encoding a proton sensing GPCR polypeptide sequence having at least 20% identity to the polypeptide sequence of SEQ ID NO: 1;
  - (c) an isolated polynucleotide encoding a proton sensing GPCR polypeptide sequence having at least 20% identity to the polypeptide sequence of SEQ ID NO: 3;
  - (d) an isolated polynucleotide encoding a proton sensing GPCR polypeptide sequence having at least 20% identity to the polypeptide sequence of SEQ ID NO: 4;
  - (f) an isolated polynucleotide comprising the polynucleotide sequence of human OGR1 (accession number: NM\_003485.1), rat OGR1 (accession number: XM\_234483), mouse OGR1 (accession number: NM\_175493), bovine OGR1 (accession number: NM\_174329), preferably human OGR1 (accession number: NM\_003485.1), human GPR4 (accession number: NM\_005282), mouse GPR4 (accession number: NM\_175668), human TDAG8 (accession number: NM\_003608) and mouse TDAG8 (accession number: NM\_008152);
  - (g) the polynucleotide sequences of human OGR1 (accession number: NM\_003485.1), rat OGR1 (accession number: XM\_234483), mouse OGR1 (accession number: NM\_175493), bovine OGR1 (accession number: NM\_174329), preferably human OGR1 (accession number: NM\_003485.1), human GPR4 (accession number: NM\_005282), mouse GPR4 (accession

number: NM\_175668), human TDAG8 (accession number: NM\_003608) and mouse TDAG8 (accession number NM\_008152); and

(h) polynucleotides in (a) to (g) which encode for a polypeptide that show a phi dependent Inositol phosphate formation in CCL39 hamster fibroblast cells or a pH dependent signal in the cAMP luciferase reporter assay in CHOK1 CRE-luc cells or CCL39 CRE-luc cells.

6. (Withdrawn) The use of an antibody, which specifically binds to a polypeptide of the claim 1, for the manufacture of a medicament for the prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced;

a pharmaceutical composition comprising an antibody for the prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalances, said antibody specifically binds to a polypeptide of the claim 1; or

a method of prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced comprising administering to a subject in need of such prevention and/or treatment an effective amount of an antibody, said antibody specifically binds to a polypeptide of claim 1.

7. (Currently amended) A method for screening for a candidate compound that antagonizes or agonizes a GPR4 related polypeptide selected from the group consisting of:

i) a polypeptide having at least 95% identity to the polypeptide sequence of SEQ ID NO: 3 and activates cAMP formation in response to pH conditions that stimulate GPR4,

ii) the polypeptide of SEQ ID NO: 3,

said method comprising:

a) contacting said GPR4 related polypeptide with a candidate compound, under pH conditions selected to stimulate said GPR4 related polypeptide to produce a GPR4 signal,

b) determining whether said candidate compound is able to increase or decrease said GPR4 signal wherein said candidate compound is an agonist or antagonist if said candidate compound is capable of increasing or decreasing said signal, respectively.

8. (Cancelled)

9. (Cancelled)

10. (Withdrawn) A method of prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced comprising administering to a subject in need of such prevention and/or treatment an effective amount of an antagonist obtainable from the method of claim 7.

11. (Withdrawn) A method of prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced comprising administering to a subject in need of such prevention and/or treatment an effective amount of an agonist obtainable from the method of claim 8.

12. (Withdrawn) A pharmaceutical composition for the prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced comprising an antagonist obtainable from the method of claim 7.

13. (Withdrawn) A pharmaceutical composition for the prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalanced comprising an agonist obtainable from the method of claim 8.

14. (Withdrawn) A diagnostic kit comprising an antibody against a polypeptide according to claim 1.

15. (Withdrawn) A diagnostic kit comprising a pharmaceutical preparation for the prevention and/or treatment of diseases and medical conditions in which proton homeostasis is imbalances, said pharmaceutical preparation comprising an antibody against a polypeptide according to claim 1.

16. (Previously Presented) The method of Claim 7, wherein said GPR4 signal is measured in a cAMP luciferase reporter assay in stable cell lines expressing said GPR4 related polypeptide under an acidic shift.

17. (Previously Presented) The method of Claim 7, wherein said candidate compound decreases said GPR4 signal, thereby antagonizing said GPR4 related polypeptide.

18. (Previously Presented) The method of Claim 7, wherein said candidate compound increases said GRP4 signal, thereby agonizing said GPR4 related polypeptide.